

### REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-11 are pending in this application, Claims 1, 7, 9, and 11 having been presently amended. Support for amended Claims 1, 7, 9, and 11 can be found, for example, in the original claims, drawings, and specification as originally filed.<sup>1</sup> No new matter has been added.

In the outstanding Office Action, Claims 9 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen (U.S. Patent No. 6,026,297, hereinafter “Haartsen ‘297’”) in view of Schmidt (U.S. Publ. No. 2003/0035388, hereinafter “Schmidt”); Claims 1-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen ‘297 in view of Haartsen (U.S. Patent No. 7,016,372, hereinafter “Haartsen ‘372’”) and Schmidt; Claims 7-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen ‘297 in view of Haartsen ‘372; and Claim 10 was rejected under 35 U.S.C. §103(a) as being unpatentable over Haartsen ‘297 in view of Schmidt and Haartsen ‘372.

In response to the rejection of Claims 1-6 under 35 U.S.C. §103(a) as being unpatentable over Haartsen ‘297 in view of Haartsen ‘372 and Schmidt, Applicants respectfully submit that amended independent Claim 1 recites novel features clearly not taught or suggested by the applied references.

Independent Claim 1 is directed to a method to provide additional bandwidth for a wireless ad hoc network configured to operate in a certain communication channel with a certain amount of available bandwidth including, *inter alia*:

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<sup>1</sup> See original Claim 5, page 15, lines 21-26; and Figures 4A and 4B.

. . . checking by a central controller of said wireless ad hoc network whether more bandwidth than said certain amount of available bandwidth is required by said plurality of wireless terminals; and

splitting up said wireless ad hoc network such that at least one new wireless ad hoc network is spawned, if more bandwidth than said certain amount of available bandwidth is required by said plurality of wireless terminals, wherein

after the splitting up of said wireless ad hoc network at least one wireless terminal of said wireless ad hoc network and/or one or more new wireless terminals exclusively belong(s) to said at least one new wireless ad hoc network, and

said at least one new wireless ad hoc network is operating in a respective different communication channel.

Independent Claim 9 recites substantially similar features as Claim 1. Thus, the arguments presented below with respect to Claim 1 are applicable to independent Claim 9.

Turning now to the applied references, Haartsen '297 describes “techniques for enabling wireless units to contemporaneously participate in communications taking place in more than one piconet at a time.”<sup>2</sup> However, Applicants respectfully submit that Haartsen '297 fails to teach or suggest splitting a wireless ad hoc network. Haartsen '297 describes that a unit participating in a first piconet may participate in a second piconet by agreeing to a hold time-out value with the other members of the first piconet.<sup>3</sup> The unit then enters a hold mode and participates in the second piconet. Once the hold time-out value has expired, the unit must resume communication with the first piconet.<sup>4</sup> Therefore, Haartsen '297 fails to teach or suggest that the first piconet has been split because the unit *contemporaneously* participates in the first piconet, i.e., the original wireless ad hoc network. Hence, the unit does not *exclusively* belong to the second piconet.

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<sup>2</sup> See Haartsen '297 at column 2, lines 37-40.

<sup>3</sup> See Haartsen '297 at column 2, lines 44-52.

<sup>4</sup> See Haartsen '297 at column 2, lines 52-54.

Page 2 of the Advisory Action asserts that Haartsen '297 discloses splitting a wireless ad hoc network when a wireless terminal stops using a piconet for a time out period and meanwhile creates and uses a new piconet. According to M.P.E.P. 2111.01, the words of a claim must be given their “plain meaning.” The “plain meaning” refers to the ordinary and customary meaning given to the term by those of ordinary skill in the art. Dictionary definitions can be used to determine the ordinary and customary meaning, see M.P.E.P. 2111.01 III. The dictionary definition of the term “split” is:

*split: to divide or separate into distinct parts or portions*<sup>5</sup>

Accordingly, the term “split” requires that an entity is divided into at least two parts. The “unit” described in Haartsen '297, never leaves piconet A, the original piconet.<sup>6</sup> Hence, none of the terminals in the original piconet leaves the original piconet. Therefore, the original ad hoc piconet is not divided and is not split.

Applicants also respectfully submit that Haartsen '297 describes a change between two established piconets. Specifically, the “new” piconet cited in column 6, lines 10-11 of Haartsen '297 identifies simply another already established but yet to be connected to piconet.<sup>7</sup> Further, column 6, lines 7-25 of Haartsen '297 describes that a unit which at first only participated in the first piconet A must establish new connections if the unit acts as master in the second piconet B. But the second piconet had been already established before the unit changes to piconet B.

In addition, Applicants respectfully note that the use of the word “*enter*” elsewhere in Haartsen '297 implies that Haartsen '297 describes a change between two *established*

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<sup>5</sup> Webster's Third New International Dictionary, Unabridged, 2201 (1993).

<sup>6</sup> See Haartsen '297 at column 6, lines 13-25.

<sup>7</sup> See, for example, Haartsen '297 at Abstract, lines 1-9.

piconets and does not describe the creation of a new piconet. For example, column 4, lines 12-15 of Haartsen '297 states “[a] slave unit leaving the first piconet can enter the second piconet as a slave . . . or as a master.”

Haartsen '297 alternatively describes that the unit may become a participant in another piconet without becoming a master.<sup>8</sup> The “other” piconet is already established. Therefore the Haartsen '297 alternatively describes that a unit may become a participant in another already established piconet with becoming a master.

Page 5 of the outstanding Office Action acknowledges that Haartsen '297 “does not specifically disclose to provide additional bandwidth if more bandwidth than said certain amount of available bandwidth is required,” but asserts that Haartsen '372 provides additional bandwidth. Therefore, turning now to Haartsen '372, Haartsen '372 “relates to bandwidth allocation in a network controlled by a central traffic scheduler, and to methods and embodiments of a scheduling algorithm that improves throughput of asynchronous services.”<sup>9</sup> However, Applicants respectfully submit that Haartsen '372 reallocates the bandwidth which is available in the network to the network units according to a priority scheme. For example, Haartsen '372, states that when the slaves’ requested capacity exceeds the actual capacity, “the slave with the lowest priority is automatically cut on its throughput request.”<sup>10</sup> Therefore, no additional bandwidth is provided.

Pages 2 and 3 of the Advisory Action assert that Haartsen '372 provides additional bandwidth for the individual terminal requesting the bandwidth. Additional bandwidth is required if a *single terminal* requests bandwidth. Applicants respectfully submit that

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<sup>8</sup> See Haartsen '297 at column 6, lines 7-25.

<sup>9</sup> See Haartsen '372 at column 1, lines 14-17.

<sup>10</sup> See Haartsen '372 at column 12, lines 23-24.

Haartsen '372 fails to provide additional bandwidth if more bandwidth is required by “*said plurality of wireless terminals*,” as recited in Claim 1.

In addition, Haartsen '372 fails to teach or suggest checking for a bandwidth overload in the network and controlling the spawning of a second network as a response to a sensed overload. Haartsen '372 describes that the dynamic bandwidth allocation results in “the slave with the lowest priority [being] automatically cut on its through-put request.”<sup>11</sup> Thus, Haartsen '372 does not sense a bandwidth overload, but automatically anticipates and avoids a bandwidth overload by limiting the throughput at the low priority slaves. Therefore, Haartsen '372 does not check whether more bandwidth than said certain amount of available bandwidth is required. Hence, Haartsen '372 cannot provide additional bandwidth when this condition occurs.

Rather, Haartsen '372 automatically anticipates and avoids the condition that more bandwidth than said certain amount of available bandwidth is required by said plurality of wireless terminals. Therefore, Haartsen '372 does not provide additional bandwidth if more bandwidth than said certain amount of available bandwidth is required by said plurality of wireless terminals.

Further, Haartsen '372 describes an alternative solution when bandwidth restrictions in a wireless network begin to decrease the communication efficiency. In such a situation, the available bandwidth is allocated between the wireless units of the same network according to a priority scheme.<sup>12</sup> Thus, Applicants respectfully submit that the use of a priority scheme in Haartsen '372 to alleviate a decrease in communication efficiency teaches

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<sup>11</sup> See Haartsen '372 at column 12, lines 32-34.

<sup>12</sup> See Haartsen '372 at column 14, lines 28-44.

away from spawning a second network. Therefore, a person having ordinary skill in the art would not consider combining Haartsen '297 and Haartsen '372.

Turning now to Schmidt, Schmidt refers to a process to wirelessly communicate data over a plurality of cellular channels in a system comprising a base station and a plurality of mobile stations.<sup>13</sup> However, Applicants respectfully submit that Schmidt fails to teach or suggest a central controller of a wireless ad hoc network that checks whether more bandwidth than a certain amount of available bandwidth is required by a plurality of wireless terminals. Specifically, Schmidt describes a mobile station with a radio frequency sniffer that computes the number of required radio channels and detects available radio channels.<sup>14</sup> The radio frequency sniffer may also reside at the base station.<sup>15</sup> The mobile station (e.g., wireless terminal) sends a message to a base station (e.g., central controller) requesting allocation of the channels.<sup>16</sup> Thus, Schmidt indicates that a central controller may sense available bandwidth and allocate the bandwidth based upon the request of a wireless terminal, but Schmidt fails to teach or suggest that the central controller checks if the wireless terminal(s) require more bandwidth. In addition, Schmidt also fails to teach splitting of a wireless network because no new wireless network is created.

Therefore, Haartsen '297, Haartsen '372, and Schmidt either alone or in proper combination, fail to teach or suggest “*checking by a central controller* of said wireless ad hoc network *whether more bandwidth than said certain amount of available bandwidth is required . . .* and *splitting up said wireless ad-hoc network such that at least one new wireless ad hoc network is spawned*,” and “after the splitting up of said wireless ad hoc

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<sup>13</sup> See Schmidt at paragraphs [0017], [0019], and [0024].

<sup>14</sup> See Schmidt at paragraph [0018].

<sup>15</sup> See Schmidt at paragraph [0024].

<sup>16</sup> See Schmidt at paragraph [0019].

network at least one wireless terminal of said wireless ad hoc network and/or one or more new wireless terminals *exclusively* belong(s) to said at least one new wireless ad hoc network,” as recited in amended Claim 1.

Accordingly, it is respectfully submitted that independent Claims 1 and 9 patentably distinguish over Haartsen ‘297, Haartsen ‘372, and Schmidt. Applicants respectfully submit that Claims 2-6 depend from Claim 1 and Claims 10 and 11 depend from Claim 9 and are therefore believed to be patentable for at least the reasons discussed above. Further, Claims 2, 4, and 5 are further believed to be patentable for the following additional reasons.

Claim 2 recites, *inter alia*, that “***said central controller determines a new central controller for said at least one new wireless ad hoc network.***” Page 6 of the outstanding Office Action states that Haartsen ‘297 describes a central controller that “determines a new central controller for said at least one new wireless ad-hoc network.” However, Haartsen ‘297 actually describes that a unit participating as a master in a network B checks the expiration of a first time-out from network A.<sup>17</sup> On expiration of the first time-out, the unit enters into a second time-out with network B. The unit is then active in network A and periodically checks the expiration of the second time-out.<sup>18</sup> Then, the unit switches back to network B at expiration of the second time-out.<sup>19</sup> The unit leaves network B ***without determining a new central controller for network B.***

Further, Haartsen ‘297 fails to disclose a structural equivalent for a central controller that determines a new central controller and a structural equivalent for a new central controller that is determined by the central controller. Haartsen ‘297 describes that when a

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<sup>17</sup> See Haartsen ‘297 at column 6, lines 12-15.

<sup>18</sup> See Haartsen ‘297 at column 6, lines 26-29.

<sup>19</sup> See Haartsen ‘297 at column 6, lines 30-36.

unit of piconet A starts to contemporaneously participate in piconet B as a master, the unit establishes the necessary connections. Haartsen '297 is silent on who decides whether or not the unit becomes master in piconet B.<sup>20</sup> Haartsen '297 also describes that a unit of piconet A contemporaneously participates in piconet B as a slave. Again Haartsen '297 is silent on the determination of the master in piconet B.<sup>21</sup> Hence, it is clear, that the unit leaves network A ***without determining a new central controller for network A.***<sup>22</sup> Thus, Haartsen '297 fails to teach or suggest that the “***central controller configured to determine a new central controller for said at least one wireless ad-hoc network,***” as recited in Claim 2.

Claim 4 recites, *inter alia*, that “***wireless terminals with certain connections that should not be interrupted are not moved*** to said at least one new wireless ad hoc network.” Page 6 of the outstanding Office Action states that Haartsen '297 describes that “said certain separation criteria assure that wireless terminals with certain connections that should not be interrupted are not moved to said at least one new wireless ad-hoc network.” However, column 4, lines 33-40 of Haartsen '297 describes that a master leaving a network A puts all slaves of network A into a hold mode. On expiration of a hold time out, the slaves wake up and wait to hear from the master again. Thus, the connection between the units is actually interrupted. Therefore, Haartsen '297 fails to teach or suggest that connections to wireless terminals that cannot be interrupted are not interrupted.

Claim 5 recites, *inter alia*:

. . . providing new commands in order to spawn said at least one new wireless ad hoc network, wherein

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<sup>20</sup> See Haartsen '297 at column 6, lines 7-37.

<sup>21</sup> See Haartsen '297 at column 6, lines 37-69.

<sup>22</sup> See Haartsen '297 at column 5, lines 58-63.



a requesting command (SPAWN\_NETWORK)  
is sent to a request wireless terminal to ask this request wireless  
terminal to move to said at least one new ad hoc wireless  
network, and

a confirmation command  
(SPAWN\_NETWORK\_ACK) is used by a request wireless  
terminal to signal that it can move to said at least one new ad  
hoc wireless network.

Page 7 of the outstanding Office Action states that Haartsen '297 describes that “a requesting command is sent to a request wireless terminal to ask this request wireless terminal to move to said at least one new ad-hoc wireless network.” However, according to column 6, lines 19-23 of Haartsen '297, the master unit comes to an agreement with all network B slaves as to a hold time-out period for piconet B. The command sets the receiving units *in a hold state*, but does not initiate a network change of the receiving unit. Thus, Haartsen '297 fails to teach or suggest a command that *initiates a network change* of the receiving unit.

Page 7 of the outstanding Office Action also states that Haartsen '372 describes that “a confirmation command is used by a request wireless terminal to signal that it can move to said at least one new ad hoc wireless network.” However, as previously mentioned, column 8, line 16 to column 9, line 25 of Haartsen '372 describes, in a general manner, a polling mode for a frequency hop/time division duplex (FH/TDD) channel. Thus, Haartsen '372 does not teach or suggest that a request wireless terminal uses a confirmation command to signal that it can move to a new ad-hoc wireless network.

Accordingly, Applicants respectfully request that the rejection of Claims 1-6 under 35 U.S.C. §103(a) as unpatentable over Haartsen '297 in view of Haartsen '372 and Schmidt, the rejection of Claims 9 and 11 under 35 U.S.C. §103(a) as unpatentable over Haartsen '372 in

view of Schmidt, and the rejection of Claim 10 under 35 U.S.C. §103(a) as unpatentable over Haartsen '297 in view of Schmidt and Haartsen '372 be withdrawn.

In response to the rejection of Claims 7 and 8 under 35 U.S.C. §103(a) as being unpatentable over Haartsen '297 in view of Haartsen '372, Applicants respectfully submit that amended independent Claim 7 recites novel features clearly not taught or suggested by the applied references.

Amended independent Claim 7 is directed to a wireless terminal and recites, *inter alia*:

. . . a receiving unit configured to receive a requesting command (SPAWN\_NETWORK) from the central controller indicating certain operating conditions for the wireless terminal to ask the wireless terminal to move to a new ad hoc wireless network and to leave said wireless ad hoc network;

a condition checking unit configured to check if the wireless terminal can be operated under said certain conditions; and

a sending unit configured to send out a confirmation command (SPAWN\_NETWORK\_ACK), if the condition checking unit determines that the wireless terminal can be operated under said certain conditions to signal that the wireless terminal can move to said new wireless network.

Page 8 of the outstanding Office Action acknowledges that Haartsen '297 “does not specifically disclose a confirmation command is used by a request wireless terminal to signal that it can move to at least one new ad hoc wireless network.” Page 8 of the outstanding Office Action also states that Haartsen '372 describes a “confirmation command [being] used by a request wireless terminal to signal that it can move to said at least one new ad hoc wireless network.” However, Haartsen '372 describes a polling scheme for a frequency hop/time division duplex channel. Hence, Haartsen '372 fails teach or suggest that the slave

sends the master a confirmation command to signal that the slave can move to another wireless network.<sup>23</sup> The slave unit continues to participate in the same wireless network controlled by the master. Accordingly, Applicants respectfully submit that because Haartsen '372 does not describe a change to another wireless network, it cannot describe a confirmation command used to signal that the wireless network can be changed. Therefore, because neither Haartsen '297 nor Haartsen '372 disclose a confirmation command, the combined teachings of Haartsen '297 and Haartsen '372 fail to teach or suggest “*a sending unit configured to send out a confirmation command* (SPAWN\_NETWORK\_ACK), if the condition checking unit determines that the wireless terminal can be operated under said certain conditions to signal that the wireless terminal can move to said new wireless network and to leave said wireless ad hoc network,” as recited in amended Claim 7.

Accordingly, it is respectfully submitted that independent Claim 7 patentably distinguishes over Haartsen '297 in view of Haartsen '372. In addition, Claim 8 depends on Claim 7 and is therefore believed to be patentable for at least the reasons discussed above.

Thus, Applicants respectfully request that the rejection of Claims 7 and 8 under 35 U.S.C. §103(a) as being unpatentable over Haartsen '297 and Haartsen '372 be withdrawn.

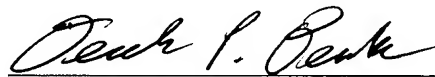
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<sup>23</sup> See Haartsen '372 at column 8, line 16 to column 9, line 25.

Consequently, in view of the present amendment and in light of the above discussion, the pending claims as presented herewith are believed to be in condition for formal allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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